

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 23, 2010 has been entered. Claim 20 has been amended.

Claims 1-36 remain pending.

Election/Restrictions

The withdrawal of claims 1-19 and 36 has been reconsidered in light of Applicant's arguments appearing on page 16 of the response filed on June 23, 2010.

The examiner notes that the limitations of presently pending claim 1 regarding the material of the input rotor and pressure plate closely parallels the subject matter of original claim 11 which was treated on the merits in the Office action mailed on March 5, 2009. This embodiment can be examined without serious burden, and thus claims 1-19 and 36 are hereby rejoined and fully examined for patentability.

Claims 21-35 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on August 28, 2008.

Specification

The disclosure is objected to because of the following informality:

In line 8 on page 31 of the substitute specification filed on November 24, 2009
"body portion 45c" should read -- body portion 45a --.

Appropriate correction is required.

Double Patenting

Applicant is advised that should claim 2 be found allowable, claim 11 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by JP 2002-171072 A (Nakagawa et al.).

Nakagawa et al. discloses a clutch disk assembly (Fig. 1) comprising a friction plate (11) being made of carbon (see e.g. paragraphs 31, line 6) and selectively contacting a flywheel (103); a disk-like input portion (15b) having an outer peripheral portion coupled to an inner peripheral portion of the friction plate; an output portion (15a) coupled to an input shaft of a transmission; and a plurality of fixing units (23) coupling the outer peripheral portion of the disk-like input portion to the inner peripheral portion of the friction plate, the fixing units supporting the friction plate, the friction plate being movable in an axial direction relative to the disk-like input portion and movable relative to the fixing units.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-195290 A (Okazaki) in view of GB 2 300 679 A (Nash et al.) and U.S. Patent No. 4,422,538 (Krumm).

Okazaki discloses a multi-plate clutch device (1) comprising a clutch disk assembly (4, 5, 6) coupled to an output rotor (3); and a clutch cover assembly (7) coupled to an input rotor (10) and including a pressure plate (24) to press the clutch disk assembly towards the input rotor. The clutch disk assembly has a hub (14) coupled to

the output rotor, a friction coupler (18, 5, 6) disposed at an outer peripheral side of the hub and being nipped between the input rotor and the pressure plate, and a damper mechanism (17) elastically coupling the hub and the friction coupler in a rotation direction. The friction coupler has a ring member (18) coupled to an outer peripheral side of the damper mechanism, a plurality of first friction plates (5) disposed at an outer peripheral side of the ring member and engaged with the ring member to be relatively unrotatable and to be relatively movable in an axial direction, and a second friction plate (6) disposed between the plurality of first friction plates and being engaged with the clutch cover assembly to be relatively unrotatable and to be relatively movable in the axial direction.

Okazaki does not disclose the plurality of first friction plates being configured by a carbon composite material, and the input rotor and the pressure plate being made of a material containing iron as the main ingredient.

Nash et al. provides evidence that it was known at the time the invention was made to form friction plates (21) of a multi-plate clutch from carbon composite material (see page 6, last line). It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the plurality of first friction plates of Okazaki by a carbon composite material since this type of material was known to be suitable for clutch plates.

Krumm provides evidence that it was known at the time the invention was made to make the input rotor (flywheel) and pressure plate of a clutch of a material containing iron as the main ingredient (see column 2, lines 42-48). It would have been obvious to

one having ordinary skill in the art at the time the invention was made to make the input rotor and pressure plate of Okazaki of a material containing iron as the main ingredient since this type of material was known to be suitable for these clutch parts.

Regarding claim 3, Okazaki discloses the multi-plate clutch device as set forth above, wherein the hub (14, 15) includes a flange portion (15) that projects outward in a radial direction around the entire periphery of the hub (14, 15) and a plurality of housing portions (21) formed by part of the flange portion (15) being cut out, and the damper mechanism (17, 19, 21) is disposed with a plurality of elastic members (17) housed in the housing portions (21) and a pair of coupler plates (19) that are disposed to be relatively rotatable with respect to the flange portion (15) in a state where the coupler plates (19) nip the flange portion (15) in the axial direction, with the coupler plates (19) being disposed with window hole portions (shown where elastic members meet with coupler plates) at positions corresponding to the elastic members (17).

Regarding claim 4, Okazaki discloses the multi-plate clutch device as set forth above, wherein the ring member (18) includes a plurality of outer teeth (See outer perimeter of 18 in Fig 1) formed around the entire outer peripheral side of the ring member (18) and projects outward in the radial direction, and the first friction plates (5) include a plurality of inner teeth that is formed around the entire inner peripheral sides of the first friction plates (5) and engages with the outer teeth.

Regarding claim 5, Okazaki discloses the multi-plate clutch device as set forth above, wherein the ring member (18) includes projecting portions (30) that are disposed

between the plurality of first friction plates (5) and project further outward in the radial direction from the outer teeth.

Regarding claim 6, Okazaki discloses the multi-plate clutch device as set forth above, wherein the clutch cover assembly (7, 11) includes an annular clutch cover (12) and cover members (11 and couplings on outer periphery of 7 and 10) that are multiply disposed in the rotation direction and couple together the input rotor (10) and the clutch cover (12), and the second friction plate (6) includes a plurality of notch portions that engage with the cover members.

Regarding claim 7, Okazaki discloses the multi-plate clutch device as set forth above, further including fixing members (20) that fix a part of the inner peripheral side of the ring member (18) in a state where the part of the inner peripheral side of the ring member (18) is nipped between the outer peripheral sides of the pair of coupler plates (19).

Regarding claim 8, Okazaki discloses the multi-plate clutch device as set forth above, wherein the ring member (18) includes a plurality of first engagement portions (See radially inward projections of 18 shown in Fig 2) that project inward in the radial direction, and the flange portion (15) includes second engagement portions (See radially outward projections of 15 in Fig 2) that project outward in the radial direction and contact with the first engagement portions when the second engagement portions rotate a predetermined relative angle.

Regarding claim 12, Okazaki discloses the multi-plate clutch device as set forth above, further comprising a release device (operating member, see [0027, line 3)

engaged with a first biasing member (26) axially and elastically deforming the first biasing member (26), wherein the release device axially moves towards the input rotor (10) to release the biasing force applied by the first biasing member (26) to the pressure plate (24).

Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-195290 A (Okazaki), GB 2 300 679 A (Nash et al.) and U.S. Patent No. 4,422,538 (Krumm) as applied to claim 1 above, and further in view of U.S. Patent No. 1,742,805 (Carhart).

Okazaki, Nash et al. and Krumm do not disclose the second friction plate being made of a material containing iron as the main ingredient.

Carhart provides evidence that it was known at the time the invention was made to make the second friction plates (7) of a multi-plate clutch of a material containing iron as the main ingredient (see page 2, lines 9-12).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the second friction plate of Okazaki of a material containing iron as the main ingredient since this type of material was known to be suitable for this clutch part.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-195290 A (Okazaki), GB 2 300 679 A (Nash et al.) and U.S. Patent No. 4,422,538 (Krumm) as applied to claims 1, 3 and 7 above, and further in view of U.S. Patent No. 6,581,259 (Yoshikawa et al.).

Okazaki discloses the fixing members 20 including a body portion, head portions disposed at both ends and have a larger outer diameter dimension than that of the body portion, but fails to disclose a stepped or tapered portion that is disposed between the body portion and one of the head portions.

Yoshikawa et al. discloses a fixing member 10 in Fig. 17 which includes a body portion (upper portion of 11 b) having a cylindrical shape, head portions (11c,11d) that are disposed at both ends of the body portion and have a larger outer diameter dimension than that of the body portion, and a stepped portion (lower portion of 11b) that is disposed between the body portion and one of the head portions (11d) and has a larger outer diameter dimension than that of the body portion and a smaller outer diameter dimension than that of the head portions (1c, 11d). The stepped portion is tapered. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the fixing members disclosed by Okazaki with the stepped tapered portion disclosed by Yoshikawa et al. to improve fastening means.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-195290 A (Okazaki), GB 2 300 679 A (Nash et al.) and U.S. Patent No. 4,422,538 (Krumm) as applied to claim 1 above, and further in view of U.S. Patent No. 4,790,419 (Loizeau).

Regarding claim 13, Okazaki discloses the multi-plate clutch device as set forth above, further comprising a release device (the operating member described at paragraph 27, line 3) engaged with a first biasing member (26) axially and elastically deforming the first biasing member (26), wherein the release device axially moves

towards the input rotor (10) to release the biasing force applied by the first biasing member (26) to the pressure plate (24). However, Okazaki fails to disclose a release device which moves axially away from the input rotor to release the biasing force.

Loizeau discloses (see Fig. 1) releasing the biasing force (F2) applied by a biasing member (17) when a release device moves axially away from the input rotor (see column 8, lines 7-15). It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the release device which moves towards the input rotor to release the biasing force disclosed by Okazaki with the release device which moves axially away from the input rotor to release the biasing force as disclosed by Loizeau to improve fit (see column 8, lines 35-44).

Claims 14, 15 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-195290 A (Okazaki), GB 2 300 679 A (Nash et al.) and U.S. Patent No. 4,422,538 (Krumm) as applied to claim 1 above, and further in view of U.S. Patent No. 5,904,234 (Kosumi et al.).

Okazaki, Nash et al. and Krumm do not disclose the biasing member of claims 14 and 15, or the cushioning plate of claim 36.

Kosumi et al. discloses a multi-plate clutch a biasing member or cushioning ring 60. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the clutch of Okazaki a biasing member or cushioning plate in order to accommodate for warpage in view of the suggestion of Kosumi et al. at column 12, lines 50-59.

Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-195290 A (Okazaki), GB 2 300 679 A (Nash et al.) and U.S. Patent No. 4,422,538 (Krumm) as applied to claims 1 and 3 above, and further in view of U.S. Patent No. 4,548,309 (Braun).

Okazaki discloses the coupler plates (19) and the flange portion (15) of the multi-plate clutch device as set forth above, but fails to disclose an annular friction member or a third biasing member arranged between a coupler plate and the flange portion. Braun discloses a clutch plate with coupler plates (4, 6); a flange portion (3); and an annular friction member (12) located between one of the coupler plates (6) and the flange portion (3); and an axially and elastically deformable Belleville spring as an annular third biasing member (10) arranged between one of the coupler plates (6) and the flange portion (3). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the coupler plates and flange portion of the multi-plate clutch device disclosed by Okazaki with the annular friction member and annular third biasing member disclosed by Braun for centering and supporting relative movement between coupler plates and the flange portion.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-195290 A (Okazaki), GB 2 300 679 A (Nash et al.), U.S. Patent No. 4,422,538 (Krumm) and U.S. Patent No. 4,548,309 (Braun) as applied to claims 1, 3 and 17 above, and further in view of U.S. Patent No. 6,026,944 (Satou et al.).

Braun discloses the annular third biasing member of the multi-plate clutch device as set forth above, but fails to disclose the annular third biasing member is formed of an

axially and elastically deformable wavy spring. Satou et al. discloses an elastically deformable wavy spring (33, see Fig. 7). It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the Belleville spring disclosed by Braun with the elastically deformable wavy spring disclosed by Satou et al. reduce parts wear.

Response to Amendment

The affidavit under 37 CFR 1.132 filed June 23, 2010 is defective because it was not executed in accordance with either 37 CFR 1.66 (which requires a statement as to where and before whom the affidavit was taken, e.g. notary's seal and venue), or 37 CFR 1.68 (which requires a declaration, in lieu of an oath to include the warning regarding willful false statements).

The affidavit under 37 CFR 1.132 filed June 23, 2010 is also insufficient to overcome the rejection of claims 1-19 under 35 USC 103(a) because the showing is not commensurate in scope with the claims because the accompanying evidence does not clearly establish that the increased life expectancy of "semi-carbon" or "semi-metallic" clutches is due primarily to the flywheel and pressure plate being made of a metal containing iron as the main ingredient, rather than being due to the second friction plate(s) being made of a metal containing iron as the main ingredient.

Claim 1 only requires the input rotor (flywheel) and pressure plate to be made of a metal containing iron as the main ingredient, and thus also covers clutches wherein both sets of plates are made of carbon composite material. In order to establish nexus

between the invention recited in claim 1 and the alleged unexpected result of increased life, the life expectancy of a clutch having the first and second friction plates formed of carbon composite material and input rotor (flywheel) and pressure plate formed of a metal containing iron as the main ingredient should be compared with the life of a clutch having the first clutch plates formed of carbon composite material and input rotor (flywheel), pressure plate and second plates each made of a metal containing iron as the main ingredient.

Response to Arguments

Applicant's arguments appearing on page 17 of the response filed on June 23, 2010 with respect to claim 20 have been considered but are moot in view of the new ground of rejection. In the newly applied reference the carbon friction plate selectively contacts the flywheel as discussed in the rejection above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 4,846,326 (Tilton et al.) and U.S. Patent No. 5,415,262 (Bernal et al.) each disclose multi-plate friction clutches including plates made of carbon composite material.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard M. Lorence whose telephone number is 571-272-7094. The examiner can normally be reached on Mondays through Fridays from 10:30AM to 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David D. Le can be reached on 571-272-7092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Richard M. Lorence/
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